Type-resolution in relative constructions

Featural marking and dependency encoding[*]

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0. Introduction

This paper constitutes the first part of a two-part study. The first line of the title characterizes the topic of the entire study, the second line characterizes the concerns of this first part. A major impetus for undertaking this research was jointly provided by the proposed theme of the Colloquium on Interface Strategies that was held in Amsterdam between 24-26 September 1997 and by a *prima facie* partial similarity between the 'classical' version of the B(inding) T(heory) (Chomsky 1981) and the typology of relative clause constructions proposed in Grosu and Landman (1998) (henceforth: GL).

The theme of the Colloquium was whether a hierarchy of preferences that had emerged from research on BT (in particular, from Reinhart (1983) and Reuland (1996) is also applicable in other domains, the hierarchy in question being, essentially, that **pre-encoding** by the Computational System (CSYS) takes precedence over **interpretive interface operations**, and that the latter in turn takes precedence over **inspection of the knowledge base**. The *prima facie* partial similarity with classical BT concerned the fact that the three types of elements named by BT's Conditions A-C are required to be (a) **bound within a particular domain** (their governing category), (b) free within that domain, but possibly **bound in a higher domain**, and (c) **free**. The typology proposed by GL exhibits types such that the necessarily present CP-internal variable needs to end up (a') operator-**bound within a particular domain** (specifically, the relative clause), (b') operator-**bound within a higher domain**, or (c') operator-**free**. These two factors, I wish to stress, provided no more than the **initial inspiration** for undertaking the research. As will be seen in what follows, the similarity just noted plays no part in my proposed analysis. As for the above hierarchy of preferences, while it will turn out to have relevance for the theory of relative clause constructions, its significance will be seen to be quite different from the one that was attributed to it in relation to BT. Thus, whereas its relevance to BT was claimed to lie in an ability to shed light on the fact that it consists of three distinct conditions on A-binding, its relevance to relatives is that it can provide an account of the local/non-local character of certain dependencies that are entirely orthogonal to GL's typology.

The division of labour between the two parts of my study on type resolution in the domain of relative clause constructions is as follows: In this paper, I concentrate on **encoding** prior to the syntax-semantics interface, and argue that type-encoding needs to be achieved by means of 'interpretable' formal features (Chomsky 1995), and that dependency-encoding is

effected by operations of the CSYS (in particular, by Merge, and possibly by Move). In the second paper, which is currently in preparation for a volume based on contributions to the Colloquium on Interface Strategies, I argue that certain **interpretive operations** and aspects of the **knowledge base** effect type-resolution in a proper subdomain of relatives; this paper refines and revises certain proposals made by GL.

The typology of relatives proposed by GL, like many other proposed typologies of relatives, tacitly assumed the existence of a coherent class of 'relative constructions'. Let us attempt to make this intuition more explicit. But first, let us observe that past literature on relatives has used a variety of criteria to identify and classify them (in particular, morphosyntactic, semantic, and pragmatic), and it is thus far from obvious that the totality of constructions which have been called 'relative' on the basis of **some** criterion or other forms a theoretically interesting class. Furthermore, in contrast to, say, declaratives, interrogatives, and comparatives, for which uniform logical types have been proposed in the literature, in particular, propositions, sets of propositions, and degrees respectively, relatives can evidently not all be assigned a single logical type. Accordingly, if one adopts, for example, the suggestion made in Rizzi (1994) to the effect that the interpretable formal features which express the 'force' of a CP include a feature [REL], one needs to characterize the import of such a feature. I offer the informal definition in (A), which, as will be seen, both characterizes an interesting 'core' of relative constructions and allows natural characterizations of increasingly 'distant' constructions.

(A)   In the spirit of Rizzi (1994), [REL] has both 'inside-' and 'outside-oriented' import.
  i.   *Inside-oriented:* CP includes (at least) one free variable in the input to semantics.
  ii.   *Outside-oriented:* The internal variable(s) of (Ai) is/are **consonant** in syntactic category and logical type with a complex XP that properly contains the relative CP (where 'consonant' is a term with the general import of 'identical', except for categorial differences limited to the 'level' of extended projection, as well as differences in logical type limited to such 'equivalence classes' as the one that consists of individuals and generalized quantifiers).

The core class characterized by (A) is that of continuous 'headed' relative constructions. I note that, under the analysis of relative extraposition proposed in Wilder (1995), extraposed relative constructions belong to the core (because they are continuous at the syntax-semantics interface). – Constructions that are analyzed as 'discontinuous' throughout a derivation, in particular, correlatives left-adjoined to IP, require a slight modification (Aii) in the sense that the variable(s) need(s) to be consonant not with a containing phrase, but with the discontinuous CP-external part of the construction, in particular, the correlate(s). – Existential relative constructions, which are simplex clauses (see below), require a more radical modification of (Aii), in particular, suppression of the reference to syntactic category, with the result that consonance applies to logical type alone. – French clauses like the bracketed one in (1a), which have the approximate distribution and semantics of (certain) small-clause predicates (see Muller 1995 and references therein), may be called '(predicative) relatives', if one wishes (on the grounds that they share internal morphosyntactic properties with French restrictive/appositive relatives), but ought not to bear the feature [REL]. For one thing, (Aii) is inapplicable. As for (Ai), it becomes otiose, since the clause needs to be marked as [PRED], that is, as involving abstraction over a variable in the course of semantics, and this implies (Ai). – Neither should the clause within the inner set of brackets in (1b) bear the feature [REL], since this would be downright misleading. Thus, observe that the constituent within the outer set of brackets is superficially indistinguishable from the one in (1c). But while the latter is an uncontroversial DP that includes a restrictive relative, the former has the semantics of an interrogative clause, and is arguably an extended projection of V (with *ce* a clausal, rather than nominal D; see Zaring 1992 for a comparable *ce* that introduces declarative clauses). I also note that the constructions within the inner sets of brackets in (1b)

and (1c) differ in their degree of transparency to extraction in the way in which interrogatives and relatives typically do (see (31) below for illustration). The feature [REL] would thus be completely inappropriate for (1b) (the appropriate feature is, of course, [Q]).

(1) a. Je l'ai   vue [qui partait].
        I   her-have seen who was-leaving
        'I saw her leaving' [approximate translation]
    b. Je me   demande [ce [qui   lui fait   mal]].
        I me   ask   that COMP her makes pain
        'I wonder what is hurting her.'
(1) c. Je revendrai [ce [qui   m' a   été   vendu]].
        I   will-resell that COMP me-has been sold
        'I will resell what was sold to me.'

For the purposes of this paper, I will be concerned with the core constructions in the sense of (A), with the 'near-core' case represented by correlatives, and with the more peripheral existential relatives, noting that, orthogonally to the 'core and periphery' characterization offered above, these constructions may be viewed as part of the continuum in (B). As GL observed, the left to right orientation on this continuum correlates with an increasingly greater contribution made by the relative clause to the semantics of the construction.

(B)   Simplex XPs Appositives Restrictives Maximalizers Simplex CPs [Existentials]
                1   2   3   4   5

Following GL, I will refer to the constructions numbered 4 and 5 as 'sortal-internal', and to those numbered 2 and 3, as 'sortal-external', a terminology meant to suggest that the sortal (or 'common noun') is construed within and without the relative clause respectively (I note, however, that this terminology is not fully accurate with respect to restrictives, whose sortal can sometimes be construed clause-internally; for an illustration of this possibility, see example (35) and the paragraph that includes it; for more extensive illustration, see Grosu (1998), which is the second part of this study).

The way in which the clause-internal variables required by [REL] receive a value in sortal-external relatives is well-known and basically uncontroversial. According to most authors, such variables acquire values through co-valuation with an antecedent in appositives, and through syntactic binding by a D(eterminer) in restrictives. Since the syntax-semantics of sortal-internal relatives is less widely known, I will provide encapsulated characterizations of their major properties in section 1. The center of gravity of the paper lies in sections 2 and 3, in which I address the issues of type-resolution and dependency characterization respectively. – The major thrust of section 2 is that while languages may or may not pre-encode their various types of relatives in configurational terms, a purely configurational treatment cannot succeed in general, and type-resolution needs to be handled in UG in terms of interpretable features, or model-theoretic logical types. In section 2.1, I critically examine a number of past proposals that relied (almost) exclusively on configurational distinctions, and show they are all inadequate in some way or other. In section 2.2, I argue that such an approach cannot succeed for maximalizers, either. In section 2.3, I make a concrete proposal for a distinctive featural characterization of the subtypes of relative constructions that fall on the continuum in (B). – In section 3, I examine the contribution of the Merge and Move operations of the CSYS to the creation of pre-encoded local dependencies of certain kinds in the core constructions defined by [REL]. Special attention is devoted to an exploration of the applicability of a 'Head-raising' analysis to all three semantic subtypes found in the core class of relatives. –

Section 4 summarizes the major results of the paper, noting that the proposed analyses pave the way towards a unified treatment of all core relative constructions.

1. Sortal-internal relatives

Sortal-internal relatives contrast with sortal-external ones not only in that sortals, if there are any, are necessarily construed internally, but also in the following respect: Whereas in appositives and restrictives, assignment of a value to internal variables is effected on the basis of **syntactically realized** elements (antecedents or binders), in maximizers and existentials, internal variables get bound by **'concealed'** operators with uniform force in each case; specifically, with uniqueness force in maximizers and with existential force in existentials. I provide more details on sortal-internal relatives in the remainder of this section, drawing freely from GL and adding information, where appropriate.

1.1. Maximalizing relatives

As GL and the references they cite observe, maximalizing relatives occur in a variety of syntactic and morphosyntactic garbs in the languages of the world, but are nonetheless easily recognizable by the following two properties: the clause-external Ds of the (continuous or discontinuous) constructions to which they belong are restricted to definites and universals, and maximalizing clauses do not 'stack' with intersecting import. The former property is illustrated in (3), where indefinite Ds and *most* are infelicitous (one must resist a possible tendency to construe such Ds as *D of the*).

(2)   [{The (three), all the, those, both, every, several, some, three, (a) few, most} student(s) {who, that} attended the party] left early.

(3)   [{The (three), all the, every, both, #several, #some, #three, #(a) few #most} student(s) that there were/was at the party] left early.

Observe that there are no comparable restrictions in (2), which exhibits a restrictive construction. The restrictions on external Ds at issue are sometimes associated with certain structural configurations (in correlatives), or with morphological properties of elements in the 'COMP area.' In (3), it is associated with relativization 'out of' the presentational context *there BE __* (for reasons to which I return below).

GL account for restrictions on external Ds in maximalizing relatives as follows: For arbitrary or motivated reasons, at the interpretive stage where the relative clause has become a lambda-abstract, an operator MAX applies to the set defined by abstraction, picking out of it a unique maximal element, if there is one (if there is no such element, MAX is undefined, with ensuing infelicity). The construction is not exhausted by CP, it exhibits (at least) an additional D, overt or null, and possibly a sortal, numerals, etc. If this external material were unrestricted, the effects of MAX would be undetectable in the construction, and its application pointless. GL suggest that the external material is subject to the restriction that it **preserve** the (individual-sum, cardinality, scale, etc.) values established by MAX within the clause, and point out that only definite and universal operators are suitable for this purpose. Hence, the infelicity of Ds of other kinds.

To avoid misunderstandings, I note that the preservation condition has only a necessary, not a sufficient character, and is thus not contradicted by the deviance of the reduced version of (4b) (noted, but not satisfactorily explained in Carlson 1977). For a suggested explanation for the contrast between the reduced and the full versions of (4b), see GL.

(4)   a.   The students that there were at the party left early.
        b.   The #(only, single, one) student that there was at the party left early.

It should be pointed out that MAX was not invented in *ad hoc* fashion for relatives with restrictions on external Ds, but is independently needed to account for the semantics of other constructions. The most uncontroversial need for MAX, or at least a concealed uniqueness operator, is in comparatives, where the operator applies to a set of degrees and yields a unique (usually maximal) degree (von Stechow 1984, Rullmann 1995). Note that without MAX, (5a) would incorrectly emerge as true in situations where it is false, and, conversely, (5b) might emerge as false in situations where it is true.

(5)   a.   Mary can run faster than John (can).
        b.   Mary can't run faster than John (can).

MAX has also been appealed to in relation to discourse anaphora (Evans 1980) and questions (Rullmann 1995), but in those cases, it seems to have the character of a default operation, which applies in the absence of certain potentially cancelling pragmatic conditions (Francez and Lappin 1994), rather than an intrinsic ingredient of the semantics of some construction. One notable difference between MAX in comparatives and relatives is that in the latter case, MAX may apply not only to a set of degrees, but also to sets of individuals ordered by the part-whole relation, as well as to n-tuples that include such sets and their cardinalities, and possibly to n-tuples of other kinds (see GL and references therein).

For completeness, I wish to note that the limitation of external Ds to definites and universals in maximalizing constructions may well be true of the overwhelming majority of cases, but does not constitute an absolute universal, there being at least one counterexample in one language (see below).

In the prototypical case, the external material is related to the clause in ways reminiscent of the anaphor-antecedent relation in discourse, *modulo* the obligatory presence of both an 'antecedent' and an 'anaphor' in maximalizing relatives, but not in discourse (in the latter case, some phrase becomes an antecedent just in case there happens to exist an element that is construed as anaphoric to it). Possibly the kind of construction that mimics anaphora most closely are correlatives of the form 'what girls are standing, they/all are tall' (see Srivastav-Dayal 1991 for abundant illustration). At the same time, the relation between 'antecedents' and 'anaphors' may be somewhat 'weaker' than in the example just cited, since consistency with **preservation** of the output of MAX can be satisfied without absolute identity. Illustrations of this state of affairs are provided by most of the data brought up in Carlson (1977). We will make the point clear here in relation to (6), which is one of the versions of (3).

(6)   The three students that there were at the party left early.

GL make the following points about this kind of construction: The clause-internal presentational context requires short-scope existential binding of an individual variable. Since the individual variable is bound existentially, another variable must be found in order to construct a lambda-abstract. This variable is provided by degree (or kind) modifiers of the individual variable, and abstraction over a degree variable in (6) yields essentially 'the set of degrees d such that there were d many students at the party.' Now, in contrast to CP, the construction, due to the nature of the external token of the sortal, designates students, not degrees (more exactly, the set of properties of a unique sum of students having cardinality three); slightly more formally, an ordered pair of a set of degrees and a set of individual sums

arises within CP, while a differently ordered pair with comparable members arises outside CP. Due to this 'mismatch', CP cannot intersect with the external sortal. However, the mismatch at issue does not block pointwise maximalization of the internal ordered pair and 'anaphoric' resumption of its members by a differently ordered pair, since the outputs of MAX are preserved. This is then why (6) has only a maximalizing construal (in Grosu, (1998), it will be shown, however, that relativization 'out of' the presentational *there* context blocks a restrictive construal only under certain circumstances, but not in general; in particular, it will be shown that restrictive readings emerge when the internal and external ordered pairs are also ordinally identical).

Let us now turn to a construction of Romanian which falls outside the prototype, in that there are no definite or universal external Ds. The view that this construction is not prototypical converges with the observation that no other language I have examined (in particular, English, French, German, Dutch, Modern Hebrew, and Modern Greek) seems to allow it. Its particular flavour is thus difficult to convey in English, and I the best I was able to do in the English translations of (7a-b) was to resort to circumlocutions.

(7) a. [{Opt, *pu⇔ine}   kilograme cât   cântăreşte bagajul   tău
          eight few   kilos   how-much weighs   luggage-the your
          de mână nu   reprezintă o   problemă
          of hand   not   represents a   problem
          'What your hand luggage weighs – and it's at most {eight, *few} kilos – won't
          be a problem.'

(7) b. [{Trei, *pu⇔ini}   kilometri cât   ai   alergat până   acuma]
     nu

          three few   kilometers how-much have-you run   till   now   not
          reprezintă   o   distan⇔ă suficientă.
          Represent   a   distance sufficient
          'What you have run so far – and it's at most {three, *few} kilometers – does
          not constitute a sufficient distance.'

Note that both versions of (7a) and (7b) exhibit **indefinite** complex DPs, but only the acceptable version designates a **precise** measure-value. I submit that CP and the external material are related here not as 'antecedent' and 'anaphor', but rather like the two phrases of an equative-specificational of the kind illustrated by (8).

(8)   John's weight is {eighty, *few, *some} kilos.

This claim relies on the observation that the restrictions on specificational measure phrases in (8) are entirely parallel to the restrictions on clause-external material in (7), and is moreover consonant with the intuitively perceived meaning of the constructions in (8). Note also that the two equated phrases in (8) are unique and maximal, presumably in virtue of definitional properties of this construction. Thus, (8) implies that (exactly) eighty kilos is John's maximal weight. Significantly, (7a) implies that eight kilos is the maximal weight of your hand-luggage, and (7b), that three kilometers is the maximal distance you have run so far. The claim that the constructions in (7) illustrate the possibility of preserving the outputs of MAX by means of an equative-specificational relation thus appears well supported.

1.2. Existential relatives

In contrast to the constructions characterized in the preceding section, infinitival, and, more generally, irrealis free relative constructions are construed just like existential (indefinite) nominals with narrowest scope. Since the latter do not occur in the major Germanic languages, but do occur in Romance, Slavic and Semitic languages, I shall use illustrations from Romance languages in what follows (in particular, from Romanian, except where otherwise indicated). The semantic contrast just alluded to can be appreciated by contrasting the senses of the realis and irrealis free relatives in (9).

(9) a. Am   pus   [ce mi-ai   dat]   pe masă
         have-I put   what me have-you given on table
         'I put what you gave me on the table.'
     b. Avem   deja   [cu   cine negocia]
         we-have already with who   negotiate.INF
         'There is already someone with whom we can negotiate.'

(9a) says that I put **that** which you gave me, and not just **something** you gave me, on the table. In contrast, (9b) makes an existential claim, as can be seen by inspecting the English translation. In general, irrealis free relatives are most natural crosslinguistically in presentational constructions, whether these use *have*-type elements, as is the case in the Romanian example (9b), or *be*-type elements, as is the case in corresponding Russian or Hebrew data, and have on the whole a highly restricted distribution (a point to which I return below).

The semantic distinction just proposed is arguably reflected in the following contrast between realis and irrealis free relatives: whereas realis free relatives typically tolerate elements with the import of the English *-ever* morpheme, such elements are uninterpretable in irrealis free relatives. The following data from Romanian illustrate this point.

(10) a. Voi   angaja pe   [(ori)cine mă   respectă].
          I-will hire   ACC (ever)who   me   respects
          'I will hire who(ever) respects me.'
      b. (Nu) am   [cu   (*ori)cine vorbi].
          Not have-I   with (ever)who   to-talk
          'There is {someone, no one} with whom I can talk.'

It is well-known that definite Ds are downward entailing with respect to their DP, and that indefinite elements are upward entailing with respect to the maximal extended projection that they head, as illustrated in (11).

(11) a. The students walk ===> The smart students walk.
      b. The smart students walk ==/=> The students walk.
      c. Some students walk ==/=> Some smart students walk.
      d. Some smart students walk ===> Some students walk.

Kadmon and Landman (1993) argue that elements like 'free choice' *any* or *-ever* are polarity items, and thus licensed in downward entailing contexts (Ladusaw 1979, 1980). Since the relative clause in (10a) undergoes maximalization and thus acquires the force of a definite DP, *ori-* '-ever' is licensed; since the relative clause in (10b) is construed as within the scope of an existential quantifier, polarity items are not licensed. Hence, the contrast between the full versions of (10a) and (10b).

In addition to being semantically distinct from other third-type relative constructions, irrealis free relative constructions are also structurally distinct from them in that they alone

consist entirely of a 'bare' clause. That is to say, they contrast with headed relative constructions in occurring in argument positions as CPs, rather than as proper subparts of DP's, and they contrast with correlative constructions in having no 'correlates'. The construction with which irrealis free relatives contrast most minimally in structural terms is that of realis free relatives, and the contrasting property is that the latter, but not the former, are part of a complex DP with a null head. This claim was supported in Grosu (1989, 1994), and also in GL, with a battery of arguments, from which I reproduce two below.

Extraction from realis free relatives results in deviance no less severe than that associated with extraction from overtly-headed definite complex DP's; this is illustrated in (12a) with Romanian and English data. Extraction from an irrealis free relative is, however, quite acceptable, as illustrated in (12b). Moreover, (12b) has the same degree of acceptability as (12d), in which extraction has operated out of an irrealis interrogative, an uncontroversially 'bare' CP (extraction from an embedded interrogative, even a finite one, seems to be easier in Romanian than in English, as noted by Comorovsky 1986; hence, the difference in acceptability ratings between (12d) and its English counterpart). Finally, the relatively degraded status of (12c), where extraction has operated out of an overtly headed relative construction with roughly the existential semantics of the free relative in (12b), indicates that the acceptability of the latter is not (entirely) attributable to its semantics.

(12) a. * *Cui*   ai   pus [ce   (i-)   ai   arătat   *t*] pe masă?
who.DAT have-you put what (him) have-you shown   on   table
'*To whom did you put what you showed on the table?'

(12) b.   *Despre ce*   nu ai   [cu   cine   să   vorbeşti   *t*]?
About   what not you-have with who SUBJ you-talk
'What do you have [no one] with whom to talk about?'

(12) c. ?* *Despre ce*   nu ai   pe   nimeni [cu   care   să   vorbeşti   *t*]?
About   what not you-have ACC no one with who SUBJ you-talk
'?*What do you have no one with whom to talk about?'

(12) d.   *Despre ce*   nu ştii   [cu   cine   să   vorbeşti   *t*]?
About   what not you-know with who SUBJ you-talk
'?What don't you know with whom to talk about?'

In short, the acceptability status of (12b) vis-a-vis the other subcases of (12) is straightforwardly accounted for under a 'bare' CP analysis, but not under a null-headed DP analysis.

Irrealis and realis free relatives further contrast with respect to certain morphosyntactic restrictions that apply to the former, but not to the latter. Thus, in headed relative constructions where either the clause-external material or the corresponding clause-internal nominal, but not both, are null, the ability of the overt element to exhibit Case and/or prepositional properties that are morphologically incompatible with the null element is limited, such limitations varying in severity from language to language; by and large, the overt element must either be fully compatible with the null element, or must exhibit a more 'oblique' morphological Case. These phenomena are well-known from traditional literature, and have also been the focus of a certain amount of interest within generative linguistics; for a summary and partial reinterpretation of the relevant literature, see Grosu (1994, section 4). Now, such restrictions are abundantly found with respect to the wh-phrases of realis free relatives, as illustrated with a French example in (13a). In contrast, such restrictions are not found in interrogative clauses, as illustrated in (13c), and, crucially, they are absent from irrealis relative clauses, as illustrated in (13b). These facts are straightforwardly accounted for if irrealis free relative constructions are analyzed, just like comparable interrogatives, as bare clauses, and if realis relative constructions are analyzed as null-headed DPs. They remain,

however, mysterious, if realis and irrealis relatives are not distinguished in the way just indicated.

(13) a. * Je frapperai [à   qui   tu   parles].
          I   will-hit   to   who you   speak
          'I will hit [the person] with whom you are speaking.'
      b.   Je n'ai   pas [à qui   parler].
          I   NEG-have not to who to-speak
          'I have [no one] with whom to speak.'
      c.   Je ne   sais pas [à   qui   parler].
          I   NEG know not to   who to-speak
          'I don't know who to speak to.'

The two arguments just provided show that irrealis free relative constructions at least **can** consist of bare clauses. There is, however, another set of facts which suggests – under certain theoretical assumptions – that they can have **no other** analysis. Landman (1998) takes a new look at the presentational *there* construction of English and at the *er* constructions in Dutch (for earlier analyses, see, for example, Milsark 1974, Enc 1991, and the various contributions in Reuland and ter Meulen 1987), and proposes that indefinite (more generally, weak) nominals can have two structural analyses. Under one analysis, they have a null D and are free to occur in argument positions, with short or wide scope. Under the alternative analysis, they lack a D, are of category NP or Num(ber)P, and occur in predicate positions, as well as in certain positions where they can acquire existential force 'from the construction.' The latter possibility is instantiated by *there* and *er* constructions, as well as by *have* constructions like the one in (14b) (note the parallelism between the restrictions on strong DPs in (14a) and (14b); for details on how the various 'constructions' provide narrow scope existential quantification, see Landman (1998).

(14) a.   There are {several, three, many, *every, *those, *most} hole(s) in my pocket.
      b.   I have {several, three, many, *every, *those, *most} hole(s) in my pocket.

Now, irrealis free relatives have a distinctly more restricted distribution, in the languages in which they are allowed, than weak nominals with narrow scope. In particular, they cannot occur in subject position, as illustrated by the Romanian minimal pair in (15).

(15) a.   O persoană cu   care să   ducem   tratativele   la bun   sfârşit
          a person   with who SUBJ carry.1PL negotiations-the to good   end
          va   fi   greu de găsit.
          Will be   hard of   found
          'A person with whom to bring the negotations to a satisfactory conclusion
          will be hard to find.'
(15) b. * Cu   cine să   ducem   tratativele   la bun   sfârşit
          with who   SUBJ carry.1PL negotiations-the to good   end
          va   fi   greu de găsit.
          Will be   hard of   found

Rather, they seem to be strongly preferred and most unhesitatingly accepted in *be* and *have* constructions of the kind illustrated in (14), and to be also possible, with cross-linguistic variations in acceptability, as objects of a small class of verbs which consists of items with the import of *look for, find,* and *give,* and more rarely, *send, buy,* and *sell.* These restrictions strongly suggest that irrealis free relatives cannot occur as objects of a null D, but only as bare

CPs having the logical type of NP/NumP (that is, <s, <e, t>>), and that their distribution is 'licensed' only in environments that can provide them with existential quantification. For this proposal to go through, it is necessary to assume that the verbs mentioned a few lines above can provide existential quantification for their NP/NumP objects. I will not attempt to provide independent support for this assumption here, but wish to point out that the obvious ability of the above verbs to take definite objects (e.g., *I found Mary behind that barn*) does not conflict with the suggestion just made, since the verbs *be* and *have* are also found in non-presentational constructions, as illustrated in (16a-b).

(16) a.   Most holes are in my left pocket, not in my right pocket.
     b.   I have most holes in my left pocket, not in my right pocket.

In short, irrealis free relatives are necessarily bare CPs with the logical type of NPs and NumPs, and with narrow-scope existential quantification provided by elements of their local context other than a selecting D. I will conclude this section by exhibiting one more feature they share with bare NPs/NumPs. As Carlson (1977) observed, indefinite nominals with definite degree or kind modifiers are fine in presentational contexts; illustrations are provided in (17). Irrealis free relatives can also have a comparable import, as illustrated in (18).

(17) a.   There are exactly that many books on the table.
     b.   I have just the right (kind of) girl for you.
(18)   Am   exact   ce   să   port   la nuntă
           have-I exactly   what SUBJ wear.1SG at wedding
           'I have exactly the suitable outfit for the wedding.'
           (literally: I have exactly what to wear at the wedding)

2. The characterization of the semantic subtypes of [REL]

As noted in the Introduction, the feature [REL] as characterized in (A) defines a core of 'headed' constructions; with the slight extension needed to encompass correlatives, it defines the classes 2-4 on the continuum in (B). Do we need additional typing features to distinguish these three semantic subtypes? Earlier proposals that have addressed restrictives and appositives have typically answered this question in the negative, explicitly or implicitly. By and large, most writers have sought to derive restrictive vs. appositive readings from **configurational** distinctions.

In section 2.1, I examine critically a number of past proposals of the kind just indicated, and point to difficulties in all of them. In section 2.2, I examine the possibility of using configurational properties to characterize maximalizing relatives, and reach a comparably negative conclusion. In section 2.3, I outline a featural approach to all the subtypes of relatives brought up in the Introduction.

2.1. Configurational approaches to restrictives/appositives

In the earlier generative literature, some proposals were confined to post-nominal relatives, and were not assumed to be necessarily extendable to all languages (for example, Emonds 1979). Other more recent proposals attempted to formulate a universally valid configurational basis for the semantic distinctions, essentially by locating them at LF (Kayne 1994). In what follows, I will evaluate their ability to deal with **two** kinds of properties (invidiously neglecting other properties, such as the apparently general requirement that in constructions

with co-occurring non-extraposed post-nominal restrictives and appositives, the latter must follow the former).

A first property, which points to a *prima facie* **similarity** between restrictives and appositives, is that the free variable within an appositive, while capable of acquiring a value by co-valuation only, nonetheless contrasts with definite discourse anaphors in that the antecedent needs to be both linguistically present and 'local'. Thus, while the basis for assigning a value to *him* in (19a) can be either of the boldfaced nominals, as well as some individual that was not even linguistically mentioned, the basis for assigning a value to *who* in (19b) can only be the adjacent boldfaced nominal. Let us call this property 'Loc(al)-Ass(ignment)', noting that something quite similar is found in restrictives, where the clause-internal variable gets bound by a maximally local external D (recall we proposed to assume, following Wilder 1995, that extraposed clauses are non-extraposed in the input to the semantics).

(19) a.   **John** told **Bill** that Mary loves *him.*
      b.   John told **Bill**, *who* spoke rudely to Mary, to go to hell.

A second property, which constitutes the fundamental distinction between restrictives and appositives, is that the latter, in contrast to the former, have the essential status of independent discourse sentences, and are thus impervious to syntactic binding by external operators. For the purposes of the ensuing discussion, it will be useful to distinguish two subcases, according as the external operation belongs to the construction or not; the contrasts found in these two subcases are illustrated in (20) and (21) respectively. Let us call these two subcases of the distinguishing property at issue C(onstructional) O(perator) B(inding) A(bility) and N(on-constructional) O(perator) B(inding) A(bility) respectively.

(20) a.   **Every** student who *ever* took an exam will get five dollars.
      b. * **Every** student, who *ever* took an exam, will get five dollars.
(21) a.   **Every** student danced with the girl who likes *him.*
      b. * **Every** student danced with Mary, who likes *him.*

Past configurational approaches to restrictives and appositives may be cross-classified with respect to (at least) two criteria: (a) whether the locus of configurational distinctions is overt representation or LF, and (b) whether, at the level where co-valuation applies, appositives do or do not form a constituent with their antecedent; for ease of reference, let us adopt for the nonce the notation [+/-O(vert)] and [+/-C(onstituent)].

The approach [+O, +C] is adopted, for example, in Jackendoff (1977), Fabb (1990) and Toribio (1992). Jackendoff assumes a nominal projection with three bar levels, and attaches restrictives and appositives as right sisters to N^2 and N^3 respectively; importantly, (what we would call today) strong Ds are left sisters of N^3. Fabb assumes a nominal projection with two bar-levels, and adjoins restrictives to N^1 and appositives, to N^2; Ds are in $SpecN^2$. Toribio assumes the DP Hypothesis, and adjoins restrictives to NP, and appositives to DP; Ds are, of course, in head-of-DP position. All these approaches can easily deal with Loc-Ass, since both restrictives and appositives form a constituent with the material that serves as basis for assigning a value to their variables. Fabb's and Toribio's can also deal with COBA, since the appositive is outside the c-command domain of D, but not with NOBA; Jackendoff's can deal with neither COBA nor NOBA.

The approach [+O, -C] is represented by Emonds (1979) and McCawley (1982). While assuming quite different theoretical frameworks, these two studies share the view that appositives are an immediate subconstituent of the main clause. This approach deals

straightforwardly with COBA and NOBA, but not with Loc-Ass, as far as appositives are concerned, and thus require an otherwise unmotivated appeal to linear adjacency.

An approach of type [-O, +C] is found in Kayne (1994), who operates within his Antisymmetry syntactic framework, one implication of which is that complements follow heads, and specifiers precede them. Both restrictives and appositives are assumed to originate universally as complements to D (possibly also to some lower functional head within DP; see footnote 67 to Chapter 8), and the (apparently) external NP is raised from some (argument or adjunct position) within IP to SpecCP. More exactly, this type of derivation is found if there are no wh(-like) pronouns; if such pronouns exist, the external NP originates as part of a DP headed by the wh(-like) pronoun, and it is this DP that undergoes movement to SpecDP, after which its NP complement is reordered to SpecDP, stranding the wh pronoun and achieving its seemingly external position. Restrictives and appositives are distinguished at LF in the following way: the former occupy their basic position, possibly due to 'reconstruction', in case they happened to be overtly raised, and the latter are in SpecDP, either through covert raising, or through 'unreconstructed' overt raising. This analysis can deal with Loc-Ass and COBA, but does not deal with NOBA.

The inability of Kayne's analysis to deal with NOBA was noticed by Bianchi (1995), who, while espousing the general framework of Antisymmetry, proposed a [-O, -C] analysis that modifies Kayne's in the following way: appositives need to undergo further covert raising and adjoin to some functional projection of the main clause, thus avoiding the scope of all possible logical operators. This proposal evidently deals with both COBA and NOBA, and since the appositive originates within the complex DP and may be assumed to leave a trace in its base position, it can in principle also deal with Loc-Ass. Bianchi also proposes a number of additional (arguably improving) modifications in Kayne's original analysis, and I return to some of them in section 3. However, as far as the solution proposed with respect to NOBA is concerned, I believe it is open to at least one serious empirical objection, as well as to certain conceptual reservations. The empirical objection arises in connection with the very assumption of covert raising all the way up to the main clause. Earlier studies within generative grammar assumed that covert movement is exempt from the kind of island constraints that apply to overt movement (Huang 1982). However, a subsequent body of studies has provided substantial evidence that covert movement is not free from locality constraints (see, for example, Reinhart 1991 and references cited therein). Furthermore, a number of recent theoretical approaches – among them, Antisymmetry – have converged on the view that limiting constraints on movement to overt movement is conceptually unprincipled; within Minimalism (Chomsky 1993, 1995), the assumption that constraints do not distinguish between overt and covert movement seems to have a definitional character. Now, observe that the surface distribution of appositives is completely free from island constraints of any sort, they being able to occur, for example, within another appositive, as illustrated in (22a); note the striking contrast between the full acceptability of (22a) and the crashing unacceptability of (22b), where wh-Movement has operated out of an appositive. The assumption of unrestricted LF raising of appositives is thus empirically problematic.

(22) a.   I sent a letter of protest to John, [who claimed that Mary, whom we all like,
        is an idiot].
    b. * *Which books* did Mary, [who bought *e,*] visit you yesterday?

In addition to the problem just noted, one may well feel qualms of a more conceptual nature. In general, students of language are suspicious of proposed covert operations that have no overt counterpart in any known language. The 'longest movement' approach to appositives put forward by Bianchi seems to fall in this category. True, some relative clauses do occur overtly left-adjoined to some IP, but to the best of my knowledge, such clauses are always

correlative, which means (i) that they are not necessarily adjoined to the highest IP, (ii) that they have not obviously achieved their surface position in virtue of movement, and above all, (iii) that they have maximalizing, not appositive semantics (see Srivastav-Dayal 1991, for discussion of these points). In short, correlatives certainly provide no conceptual support for Bianchi's long-raising analysis. A further observation that further erodes the plausibility of Bianchi's proposal is that, whenever languages distinguish restrictives from appositives in terms of their overt external syntax, they seem to do so by placing the appositives **further to the right** than the restrictives, which is precisely the opposite of what Bianchi proposes. This phenomenon is well-known from English and languages with comparable properties, but is even more pointedly brought home by languages where certain morphemes intervene between the positions of restrictives and appositives. Illustrations of this state of affairs (from Lehmann 1984) are provided in (23)-(26), where the relevant morphological marker is boldfaced; in the Indonesian examples, the marker appears to be the definite D, in the Yucatec examples, the marker has the more general function of signaling the end of some scopal domain.

—Indonesian

(23)   lelaki [yang sedang tidor] **itu**
        man   REL PROG   sleep the
        'The man who is sleeping...'   [restrictive]
(24)   lelaki **itu**, [yang sedang   tidor]
        'The man, who is sleeping, ...'   [appositive]

—Yucatec Mayan

(25)   tu?š   yan le tak'in [t-a   wa?l-ah he? a   tas-ik]**-e?** ?
        where be the money [PRT-2 say-TR FUT 2   bring-TR]-D
        'Where is the money that you promised to bring?'   [restrictive]
(26)   le   santo k'in**-e?** [k   k'ulktabal]-e? wa?kum-ah toon telo?.
        The   holy sun-D 1PL worship-PTL preserves us   here
        'The holy sun, which we worship, keeps us alive.'   [appositive]

For completeness, let us also take a look at a somewhat different type of approach to Loc-Ass, COBA, and NOBA. Safir (1986) proposes to assume that operator-binding takes place in the LF component. Appositives – and parentheticals in general – are introduced into syntactic structures in a **later** component called LF'. This approach accounts for COBA and NOBA, and can also deal with Loc-Ass, since appositives may be inserted into the extended nominal projection. However, it is open to both empirical and conceptual objections, some of which are pointed out by Bianchi (see section 1.3. of her Chapter IV). On the empirical side, it is unclear how introducing parentheticals after LF, and thus covertly, can guarantee their correct positioning in overt representations, since the two branches of a derivation are assumed not to 'communicate' with each other. On the conceptual side, if LF' lies outside the computational system, Safir's proposal implies that Merge can operate outside the Computational System, a strange position, to say the least (this point was brought to my attention by Julia Horvath).

For perspicuousness, I summarize in Table 1. the gist of the proposals reviewed above, and in Table 2., their degree of success in dealing with Loc-Ass, COBA, and NOBA (asterisks indicate empirical and/or conceptual problems).

Table 1.

	Restrictives	Appositives
Both are part of the (extended) N-projection throughout a derivation		
Jackendoff (1977):	Daughter of N^2	Sister of N^3 and of D
Fabb (1990):	Adjunct to N^1	Adjunct to N^2
Toribio (1992):	Adjunct to NP	Adjunct to DP
Only Rs are part of the N-projection throughout a derivation		
Emonds (1979):	Part of N^{max}	Sister of main S
McCawley (1982):	Part of N^{max}	Daughter of main S
Not necessarily configurationally distinguished until LF		
Kayne (1994):	Compl of D	Spec of D
Bianchi (1995):	Compl of D	Spec of main-clause F-head
Configurationally distinguished only until LF		
Safir (1986):	Part of N^{max} throughout	Not part of main S till LF, inserted into N^{max} at LF'

Table 2.

	Loc-Ass	COBA	NOBA
Jackendoff	yes	no	no
Fabb, Toribio	yes	yes	no
Emonds, McCawley	no	yes	yes
Kayne	yes?	yes	no
Bianchi	yes?	yes	yes*
Safir	yes	yes	yes*

2.2. A configurational approach to maximalizers?

In contrast the restrictives and appositives, there have been, as far as I know, no attempts to provide a universal characterization of maximalizing relatives in terms of configurational properties. Nonetheless, it is worth considering the likelihood of success of such an approach.

To be sure, there is one overt configuration which appears to be invariably associated with a maximalizing construal, that of correlatives left-adjoined to IP. Suppose one were to propose that all maximalizing relatives occur in a comparable configuration at LF (in correlatives, through base-generation, and in 'headed' constructions, through covert raising). Would such a proposal be tenable, and if yes, would such a configuration force a maximalizing construal?

In response to the first question, I wish to note certain empirical considerations that argue against such a move. Observe that in (27), the bracketed maximalizing relative includes a pronoun (in italics), and that this pronoun is construable as bound by either of the boldfaced quantifiers.

(27) {**Every, no**}student read the three books [that there were on *his* desk].

Srivastav-Dayal (1996) explicitly notes that in correlative constructions, quantifiers in the matrix clause may not bind a variable in the correlative, which is entirely expected if the correlative maintains its IP-adjoined position throughout a derivation, since the variable it includes is not c-commanded by any matrix quantifier. But on the assumption that scope is

decided at LF, the possibility of syntactic binding in (27) is incompatible with a covert correlative-like analysis.

What has just been said renders the second question asked two paragraphs above academic. Nonetheless, let us note that even if the scope facts were different, it would be necessary to show that the configuration at issue **forces** a maximalizing construal. A restrictive construal would certainly be excluded (since D could not bind into the relative), but an appositive one might not be (recall that Kayne and Bianchi proposed to assume comparable configurations precisely for appositives). More generally, it is unclear, in the absence of a theory of maximalization (which, to the best of my knowledge, does not exist at the moment), that a left-adjoined configuration rules out any conceivable construal other than maximalization.

In short, it seems unlikely that a purely configurational account of the semantics of maximalization in relatives can get off the ground.

2.3 A featural approach to relative subtypes

In the two preceding sections, we have seen a number of reasons for being suspicious of the view that both the distinctive semantic properties and the Loc-Ass properties of the three major subtypes of relatives (that is, those numbered 2-4 on the continuum in (B)) can be captured in purely configurational terms. Let us then adopt an approach in terms of interpretable features.

For restrictives, we may adopt the **minimal** characterization [REL, PRED, MOD], noting that it has the same import as the Montagovian type $<<s, <e,t>>, <s, <e,t>>>$. For maximalizing relatives, we may minimally represent them as [REL, MAX], which incorporates the assumption that maximalization is part of their definition. As pointed out in section 1.2, [MAX] is not used in *ad hoc* fashion in relatives, it must also be assumed to characterize at least comparatives, even if in the latter case, it need not be explicitly stated, having non-distinctive, redundant status (since comparatives are always [MAX], while only some relatives have this property). For a model-theoretic characterization of the logical type of maximalizing relatives, see GL and references therein. Concerning appositives, they may be minimally characterized as [REL, E], borrowing an idea from Emonds (1979), who proposed that appositives are base-generated under a node 'E(xpression)'. The import of [E] is that the constituent which bears it has an illocutionary force independent of that of the matrix, and thus the essential status of an independent discourse sentence.[1] I leave open the question of the model-theoretic counterpart of [E].

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[1]   For completeness, I wish to note that Emonds, while base-generating appositives under a separate E-node, proposed that they are subsequently lowered and adjoined to the main clause S' node (that is, immediately under the main clause E-node), with the implication that the appositive and the main clause form a single illocutionary unit. The justification he offers for this move is that, while parentheticals like the one in (ia) are asserted, minimally different appositives like the one in (ib) are – in his view – presupposed.
(i)   a.   Too much sun made these tomatoes, and we paid a lot for them, rot on the vine.
        b.   Too much sun made these tomatoes, which we paid a lot for, rot on the vine.
However, Emonds appears to be wrong concerning the construal of (ib), as Chierchia and McConnell-Ginet (1990) point out. The property NOBA of appositives is shared by independently asserted discourse sentences, but not by uncontroversially presupposed clauses, as illustrated in (ii), and this points to the conclusion that appositives are asserted, not presupposed.
(ii)   a. # **Every boy** stared at Mary. She began to dislike *him.*
        b. # **Every boy** stared at Mary, who began to dislike *him.*
        c.   **Every boy** was amazed that Mary disliked *him.*

Let us now turn to the non-core and non-[REL] constructions mentioned in earlier sections. In line with proposals made in section 1.2, existential relatives are open sentences that receive existential quantification from some feature of their context. I propose the minimal characterization [REL, PRED]. [PRED] ensures that the variable required by the first part of [REL] (see (Ai)), gets abstracted over, and a 'weakened' version of the second part of [REL] (see (Aii)), that is, a consonance requirement limited to logical type, is satisfied by existential quantification. The Montagovian counterpart to the proposed characterization is $<s, <e, t>>$. Note that the absence of [MOD] keeps such relatives distinct from restrictives.

Finally, the French constructions in (1a) and (1b) may be minimally characterized as [PRED] and [Q] respectively.

3. On dependency-encoding by the computational system

In the preceding section, I have argued that the semantic properties which distinguish the various types of relative clauses are not retrievable from their configurational properties, and thus cannot be viewed as pre-encoded by the Merge or Move operations of the CSYS; rather, I argued, the relevant distinctions need to be encoded by means of featural (or model-theoretic) typing. I nonetheless believe that the CSYS does have something to contribute to the analysis of relative clause constructions, in particular, to the analysis of the dependencies that hold between the clause and the remainder of the construction whenever the latter is not null; that is to say, in cases 2 - 4 in (B).

In earlier sections, it has been abundantly noted that the nature of dependency between a relative clause and the external part of its construction is semantically different from type to type. Orthogonally to this state of affairs, the dependency formed by the clause and the external material may have a **local** or a **non-local** character. Local dependencies are found in the core cases defined by [REL], that is, in those cases where the clause and the remainder of the construction form a constituent. Non-local dependencies are found in correlatives, more exactly, in those correlatives that are left-adjoined to IP, and whose correlates may occur at an arbitrary linear distance and depth of embedding within IP (the reason for the qualification just expressed is that, as Srivastav-Dayal 1991 points out, correlatives may also occur left-adjoined to a correlate, in which case the correlative-correlate dependency is evidently local). Now, to say that the elements which form a semantic dependency also form a syntactic constituent is to say that the CSYS has pre-encoded a possible dependency one member of which is a relative clause. But we may still wonder why in such a case, the relative clause cannot be involved in a different semantically conceivable dependency. To clarify the issue by means of an example, observe that in *Bob, who – remember – I can't stand, wants to give him a prize, Bob* is the only possible antecedent of *who,* while in very similar *Bob – and remember I can't stand him – wants to give him a prize,* the leftmost token of *him* may corefer with *Bob,* with the rightmost token of *him,* and possibly even with some third unmentioned individual. An answer to this puzzle may be derived by extending a proposal made in Reuland (1996), and to which I alluded in the Introduction:

(28)   If an operator-variable structure at the C[onceptual]-I[ntensional] interface
         can either be obtained from
         i.   a structure in which this dependency has been pre-encoded, or
         ii.   a structure without pre-encoding,

I conjecture that Emonds may have been misled by the fact that asserted information may nonetheless be known to both speaker and addressee, the pragmatic justification for assertion being, for example, that the speaker wishes to draw the addressee's attention to a point he considers important.

> option i. will be taken.

In other words, I am proposing that pre-encoding by the CSYS forces the resulting **possible** dependencies to be **actual** ones in this case.

But how exactly are the dependencies at issue pre-encoded by the CSYS? One possible view, which has often been adopted in past literature, is that the pre-encoding is done entirely by Merge. Another view, which maintains that clause-external sortals undergo raising out of the relative IP, has sometimes been envisaged in earlier literature in relation to specific subtypes of relatives; for example, with respect to restrictives in Schachter (1973), and with respect to 'amount' (maximalizing) relatives in Carlson (1977). Kayne (1994) was, to my knowledge, the first writer who proposed to use such an approach in an attempt to provide a unified account of both restrictives and appositives. Neither Kayne nor Bianchi took maximalizing relatives into account, but had they done so, they would in all likelihood have extended the raising approach to 'headed' maximalizers as well. In what follows, I will explore some of the consequences of adopting the raising approach with respect to all 'headed' relative constructions. For the purposes of this exploration, I will assume the following features of the raising analysis in Bianchi (1995), which is built on Kayne (1994), but also differs from the latter in a number of respects that arguably constitute improvements (some possible improvements will be noted in what follows).

I.   What is usually analyzed as the CP-external 'common noun' (in more precise terms, the external NP or NumP) originates as complement to an overt or null D within the relative IP; when this D is overt, it is a wh(-like) relative pronoun.

II.   In contrast to earlier analyses, the complex DP that forms the 'headed' relative construction is not, strictly speaking, an extended **nominal** projection. Rather, the relative CP is base-generated as a complement of D, or of some functional head lower than D, such as Num(ber).

III.   In relatives introduced by a complementizer (e.g., *that*) and lacking wh(-like) pronouns, a null-headed DP within IP (see (I)) is reordered to SpecCP, and the null D is 'absorbed' into the external D, a step that makes it 'invisible' to the subsequently applicable semantic interpretive mechanisms. The rationale for positing this null D (which Kayne did not posit) is purely syntactic: it ensures that the 'gap' within IP is invariably a DP (see Borsley 1997 on the desirability of this move), and it also yields an account of the impossibility of pied-piping anything other than the 'external' common noun along with the null D.

IV.   In relatives with wh(-like) pronouns, the 'common noun' reaches SpecCP in two steps: first, the DP headed by the wh-pronoun is reordered to the Spec of a verbal functional projection lower than CP (which we will refer to simply as FP, since its precise nature is not at issue here); second, the complement of the wh-pronoun is reordered to SpecCP, stranding the wh-pronoun in SpecFP. In Kayne's original analysis, the second movement targeted the Spec of the DP moved in the first step, and this had the undesirable consequence that the string consisting of the wh-pronoun and the relative IP was characterized as a non-constituent (note that in appositives, this string is intonationally separated from the surrounding material); Bianchi's analysis avoids this consequence (which, incidentally, was also pointed out in Borsley's critique of Kayne's monograph).

V.   Movement to an A'-position has the major features proposed in Chomsky (1993). Thus, movement leaves 'behind' a **full copy** of the raised element, and the resulting chain can be 'tampered' with at LF in the sense that chain links may be partially or totally deleted, and variables may be inserted; such tampering is restricted by the need to achieve well-formed operator variable configurations, and can be used to account for 'reconstruction'

effects. To illustrate these points, consider the question in (29a), which has the essential properties of (29b) in the output of Wh-Movement ((29a) is derived from (29b) by 'tampering' with the chain at PF in a way that does not necessarily parallel LF tampering; PF deletion is of no concern for what follows). (29b) can be turned into well-formed LF outputs in two distinct ways, which give rise to slightly different construals. One option is to delete the material italicized in (29c) and to substitute an individual variable for it; another option is to delete the material italicized in (29d) and to substitute a number variable within the lower chain-link. (29c) asks for a number of books, and is most naturally answered by, for example, 'five books'; (29d) asks for a number, and is most naturally answered by 'five'.

(29) a.   [How many books] did you read ?
     b.   [How many books] did you read [how many books]
     c.   How many books did you read [*how many books*]
     d.   How many *books* did you read [*how many* books]

VI. Locality is redefined in a manner that makes it in principle possible for the common noun of a 'headed' relative construction to agree with the external D, much like a D and its complement NP may agree with each other in a simplex DP. Instead of the notion 'minimal domain' of Chomsky (1993), Bianchi adopts the notion with the same name in Manzini (1994), where it is proposed that the minimal domain of a head H excludes H's Spec and includes the Spec of its complement; minimal domains are related to each other (they form a 'dependency') if their heads are related by one of the following two kinds of relation: complementation or checking. Now, Bianchi also proposes to assume that the Spec of H's complement belongs to H's checking domain; under this further assumption, agreement between D and the common noun of a 'headed' relative construction can be accounted for.

Let us now examine some further aspects of the analysis of 'headed' relative constructions, keeping in mind (I)-(VI) above.

In (II) above, it was noted that 'headed' relative constructions are not base-generated as extended **nominal** projections. At the same time, it would not be appropriate to view them as extended **verbal** projections, either, since this would make them indistinguishable from constructions with genuine 'clausal determiners', such as the bracketed structures in (30) and (1b) (see Zaring 1992 for discussion).

(30)   Je veillerai   à [ce que Marie lise   ce   livre].
          I will-take-care of DET COMP Mary read this book
          'I will see to it that Mary reads this book.'
(1) b.   Je me demande [ce qui   lui fait   mal].
          I me ask   DET COMP her makes   pain
          'I wonder what is hurting her.'

Observe that the bracketed constituents are construed as a proposition and a question respectively, in contrast to the bracketed constituent in (1c), which, although superficially similar to the one in (1b), is construed as a generalized quantifier.

(1) c.   Je revendrai [ce qui   m' a   été   vendu].
          I will-resell DET COMP me has been   sold
          'I will resell what was sold to me.'

I suggest that the element *ce* carries the feature [+V] in (30)-(1b) and the feature [+N] in (1c), and that the external Ds of relative constructions in general are [+N]. This featural charaterization makes it possible to account not only for semantic distinctions between relative clause constructions and constructions like those in (30)-(1b), but also for differences in opacity to extraction. Thus, observe that (31a) has the marginal acceptability of extraction out of finite interrogatives, while (31b) has the strong unacceptability of violations of the Complex NP Constraint. While a theory of extractability goes beyond the scope of this paper, it seems to me that the featural contrast just proposed – in particular, the 'switch' from [+V] to [+N] in relatives and the lack of such a switch in data like (30), (1b), and (31a) – provides a promising basis for constructing an account of the contrast in acceptability between (31a) and (31b).

(31) a. ? *A   qui* te   demandes -tu [ce que   Marie a   donné *t*]?
          To who you ask   you DET COMP Mary has given
          '?Who do you wonder what Mary gave to?'

(31) b. * *A   qui* as-tu   reçu   [ce que   Marie a   donné *t*]?
          To who have-you received DET COMP Mary   has given
          '*Who did you receive what Mary gave to?'

In (VI) above, it was suggested that a functional head and the Spec of its complement may form a configuration for checking feature-matching, and it was noted that this permits the kind of agreement that operates within simplex DP's to also operate in complex DP's that include a relative clause. But if so, it seems entirely natural to also allow the binding of a common noun by D in the kind of complex DP's at issue with semantic effects comparable to those found in simplex DP's. That is to say, the common noun in SpecCP may be construed just like a nominal complement of D, even though it does not configurationally have complement status. A natural consequence of this state of affairs is that the common noun is semantically 'cut off' from the remainder of CP. In short, complex DP's with a relative clause may receive under the theory just outlined exactly the kind of construals that have been proposed on the basis of more conservative structures (with the relative clause adjoined to some perfect or extended projection of N).

Before examining the derivation of the three subtypes of relatives in more detail, let us briefly confront the issue of the factors that trigger movement within relative CPs. The Manzini-Bianchi theory of locality retains the Spec-Head configuration as a valid one for feature-checking, even though the two elements belong to different minimal domains; without such an assumption, it is hard to see how the strong feature on the C-head of a direct question could be checked. Let us then assume that overt wh-movement in relatives is triggered in essentially the same way as in non-relative wh-constructions; in particular, the trigger may be a strong feature on the head of FP. The next step, raising of the common noun to SpecCP, may be viewed as triggered by a strong N feature on D; the stranding of the wh-pronoun is attributable to the fact that its pied-piping is not required by any principle. In contrast, the non-stranding of a null D is 'forced' by the need to eliminate an 'unidentified' null category (see Bianchi for details).

Let us now consider more closely how the derivation of a sample of relatives of the three semantic types might operate under the assumptions outlined above.

First, consider the wh-construction in (32a), which looks essentially as in (32b) at the stage that immediately follows the two-step raising outlined in (IV) above.

(32) a. **The** boys(,) who Mary dislikes, ...
(32) b. **The** [CP boys [FP *who boys* [IP Mary dislikes *who boys*]]]

(32b) can give rise to either an appositive or a restrictive construal, depending on whether C is marked [REL, E] or [REL, PRED, MOD]. In the former case, the boldfaced D is unable to syntactically bind into the clause, since the feature [E] assigns to it the status of an independent discourse sentence. However, given the theory of locality outlined in (F) and elaborated in the ensuing text, D **can** bind the (variable restricted by the) NP in SpecCP, since this NP escapes the domain of [E]. As a result, the initial sequence *the boys* is construed as a generalized quantifier, much as when this sequence forms a simplex DP, since the theory of locality we are assuming makes the configurational distinction irrelevant.

Assume now that the C in (32) is marked [REL, PRED, MOD]. The variable required by [REL] is created just like in the previously considered case, but the feature [PRED] requires the formation of a lambda-abstract over that variable; in view of the assumed theory of locality, SpecCP escapes the domain of [PRED] and [MOD], just as it escaped the domain of [E] in appositives. The feature [MOD] requires the abstract to intersect with a sortal, if there is one, yielding a more narrowly specified lambda-abstract. This abstract gets turned into a generalized quantifier through application of a D-function.

Let us now consider a construction without wh-pronouns, in particular, (33a), to which Bianchi assigns the essential representation in (33b) in the output of raising to SpecCP.

(33) a.   The boys that Mary dislikes ...
(33) b.   The [$_{CP}$ Ø boys that [$_{FP}$ [$_{IP}$ Mary dislikes $\varnothing$ *boys*]]]

In contemporary Standard English, such constructions may be restrictive, but not appositive. Furthermore, as Carlson (1977, 529) observed, there are no principled grounds for excluding a maximalizing construal in such cases, even though a restrictive and a maximalizing construal yield equivalent semantic outputs in the case at hand.

If C is typed [REL, PRED, MOD], the operations are almost the same as for (32b), with the only difference that there is a single copy to delete within CP, and that the null D in SpecCP gets absorbed into the external D. – If C is typed [REL, MAX], things proceed as follows: within the clause, the null D is deleted, but *boys* is retained and used as a restrictor on an individual variable. Abstract formation yields an expression of the form λx [Boy(x) and Mary dislikes(x)], and MAX is applied to this abstract, yielding the unique maximal i(ndividual)-sum within the set defined by the abstract; much as in the previously considered cases, SpecCP falls outside the domain of features that trigger clause-internal operations, in particular, of MAX. Outside MAX's domain, the null D is absorbed into the external D. As for the copy of *boys* in SpecCP, whether it is deleted or not is immaterial, given the constraint that properties fixed within the clause, in particular, by sortal construal and MAX, must be **preserved** in the complex DP. Along the lines proposed by GL, CP together with its Spec is construed just like CP without its Spec, that is to say, as the maximal sum of boys disliked by Mary; application of *the* to CP yields the set of properties of the sum of boys disliked by Mary.

The remark made in the preceding paragraph to the effect that the higher copy of *boys* need not be deleted bears some additional elaboration. As an anonymous referee observed, if two chain links were allowed to be **independently** used in logical form, it would incorrectly be predicted that *himself* in *John wondered which picture of himself Bill saw* could be co-construed as bound by both *John* and *Bill*. What I am suggesting, however, is only that chain links may be used more than once just in case all except one are used redundantly. Srivastav-Dayal (1991) observes that in correlatives, where the same preservation requirements obtain as in 'headed' maximalizing constructions, distinct tokens of the same sortal may overtly occur both within the correlative and within the correlate. The two sortals in the latter case do not belong to a movement chain, but I see no principled grounds for excluding two comparable sortal-tokens that do belong to a movement chain, so long as the preservation

requirement is met. At the same time, it should be clear that a second 'higher' sortal-token is certainly not necessary to achieve a generalized quantifier construal for the complex DP. In realis free relatives, which have a null external definite D, but no 'external' sortal, the interpretive operations that lead to the construction of a generalized quantifier may apply to the output of MAX without 'structural support', as noted by GL.

Let us consider one slightly more complex construction which is unambiguously maximalizing (see GL and references therein), in particular, the one in (34a); after raising, the representation is essentially (34b).

(34) a.   The three boys that there were at the party ...
(34) b.   The [$_{NumP}$ three [$_{CP}$ Ø boys that [$_{FP}$ [$_{IP}$ there were ∅ boys at the party]]]]

Observe that CP is here the complement of a Num(ber) head. We must therefore assume that Num, rather than D, carries the strong feature that triggers raising, and presumably also that the null D in the upper chain-link is absorbed into the immediately higher Num, rather than into D (which is 'too' high). Within the clause, we must assume, just as in the preceding case, that the null D is deleted and the sortal is used as a restriction on an individual variable, but since that variable needs to be bound by an existential operator, we must also insert a degree variable, in particular, one which defines the cardinality of the set of individuals, and this, in order to make possible the construction of a lambda-abstract with clausal scope (see section 1.1). However, no degree variable is needed in the higher chain link, since there is a single CP-external operator in need of a variable to bind, the external D. The preservation condition requires that the cardinality value established by MAX within the clause be preserved in the construal of the complex DP. Note that, in the particular case of (34b), an explicit cardinality specification is provided by the external numeral, and it must, of course, be identical to the value fixed by MAX clause-internally.

For completeness, I wish to note that, if 'reconstruction' is operative in restrictive constructions – and data like (35) suggest that it is (note the **in**definiteness of the complex DP) – then 'sortal-internality' is not a fully adequate characterization of maximalizing and existential relatives.

(35)   [A picture of herself that Mary truly likes] is hard to imagine.

To see this, observe that under any implementation of reconstruction (including the one assumed in Chomsky 1993 and Bianchi 1995), *(a) picture of himself* must be construed as restricting the variable **within the clause**. It would thus appear that what really distinguishes maximalizing relatives from restrictives is that the clause-internal variable characteristic of [REL] must be quantifier-bound clause-internally in the former, rather than the fact that its sortal is construed clause-internally.

Having shown how a raising analysis of the three subtypes of 'headed' relatives might operate within (Bianchi's version of) the Antisymmetry framework, let us attempt to determine what (non-framework specific) advantages, if any, such an approach may have over a more conservative analysis, in particular, one that right-adjoins relatives to some nominal extended projection, which need not be the same for all subtypes (the framework specific advantage being, of course, that the conservative approach is inconsistent with Antisymmetry).

One *prima facie* conceptual advantage emerges from Bianchi's 'unifying' assumption (II) (taken over from Kayne), in particular, from the view that all 'headed' relatives start their syntactic life as complements of some D (recall that under the right-adjunction analysis, adjunction is not necessarily to the same category for all subtypes; see, for example, the first three analyses listed in Table 1.). However, whether this *prima facie* advantage is a genuine

one depends on Antisymmetry's ability to account for surface ordering constraints on the co-occurrence of appositive and non-appositive clauses within the same complex DP. As noted in section 2.1, co-occurring restrictives and appositives need to occur *in that order* in non-extraposed constructions, sometimes separated from each other by a morphological marker (see (23)-(26)). In the conservative approach, this state of affairs is handled by assuming that appositives are adjoined 'higher' than non-appositives. In the Antisymmetry approach, an account was proposed (Kayne 1994, 113-4) that relied on two doubtful assumptions: (a) that appositives must raise across D at LF (see the critique of this view in section 2.1), and (b) that in a sequence of 'stacked' relatives, only the rightmost can raise (at LF), on the grounds that raising a non-final relative would violate (some version of) the Left Branch Condition. Assumption (b) rests on the alleged inability of appositives to iterate (Kayne offers (36a) as supporting evidence). But (36b) shows that appositives **can** iterate, subject, apparently, to certain pragmatic felicity conditions that need not concern us here.

(36) a. # The book, which I've read twice, which is on the table...
     b.   John, who never finished high-school, who can't in fact even read or write,
          wants to do a doctorate in astrophysics.

Furthermore, assumption (b) assumes that prenominal relatives in languages like Japanese or Turkish do not iterate, and this seems to be incorrect (for illustration, see Wartemberg 1997). In sum, the *prima facie* advantage addressed in this paragraph is not obviously a genuine one.

An empirically-based advantage that was prominently claimed by Kayne and Bianchi with respect to the raising operation *per se* is that restrictives show reconstruction effects for the purposes of the Binding Theory (see (35) above). The strength of this argument is, however, unclear, since reconstruction effects are also detectable in situations where a movement analysis seems implausible; for example, in pseudo-clefts like *the individuals that John and Mary dislike most are each other*.

A somewhat different argument in favour of a raising analysis for certain maximalizing constructions was put forward by Carlson (1977). Carlson observed that comparative constructions contrast with degree relatives in that the former, but not the latter, allow 'subdeletion', as illustrated by the contrast between (37a-b) and (37c). Since the two kinds of construction exhibit many similarities, as Carlson abundantly shows, one might expect whatever mechanism accounts for the 'gap' in comparatives, for example, the A'-movement of a null degree operator, to also be operative in degree relatives; nonetheless, the contrasts in (37) suggest that this is not so.

(37) a.   They drank as much wine as we drank (beer).
     b.   They ran as many miles as we ran (kilometers).
     c.   They drank the two liters of wine that we drank (*of beer).

The effect noted by Carlson can also be replicated in languages that use overt wh-forms in the kinds of construction at issue. Thus, wh-like forms (which trigger Pied-Piping) are found in certain 'equative' comparatives of Romanian, as shown in (38a), and also in some degree relatives, as may be seen by inspecting (7a-b). Nonetheless, wh-forms like those in (7) may not 'modify' additional material, as illustrated by (38b). Note that the deviance of the full versions of (37c) and (38b) are unlikely to be semantic, since 'subdeletion' is possible in Hindi correlatives, as shown in (39) (a datum kindly provided to me by Srivastav-Dayal in p.c.).

(38) a.   Ion a   alergat exact   atâ⇔ia   kilometri câte   mile a   alergat Maria.
            Ion has run   exactly   as-many   kms.   how-many miles has run   Maria

'Ion ran exactly as many kilometers as Maria ran miles.'

(38) b.   Trei   kilometri {cât,   *câte   mile} ⇔i-a   cerut   doctorul
           three   kms.   how-much how-many miles   you-has   asked   doctor-the
           să   alergi zilnic nu reprezintă o distan⇔ă prea mare.
           SUBJ   run   daily not represents a distance   too   great
           'The three kilometers that the doctor asked you to run (*miles) daily
           do not represent too great a distance.'

(39)   jiitnii   kilomeTer maiN ek   hafte   meN   dauRtii huuN,
           how-many kilometers I   one   week   in   run
           utnii-hii   miil   jaun   ek   din   meN dauRtaa hai
           that-many miles John   one   day   in   runs
           'The kilometers I run in one week, John runs that number of miles in one day.'

Now, observe that data like those in (37) are neatly accounted for if sortal-raising is part of the analysis of 'headed' relatives, but not of comparatives, since under such a view, there would be no source for the full versions of (37c) and (38b). As Carlson observes, such facts are not impossible to account for within an analysis that base-generates the sortal in its surface position and assumes A'-movement within the clause, but this would require some stipulation, for example, that the constituent that is moved within the clause must match the entire construction in syntactic category. Thus, with respect to the above data, a raising analysis does have a certain edge over its non-raising competitors.

On the whole, the empirical advantages that result from the adoption of the raising analysis are far from overwhelming, and a decision to retain it will largely depend on how strongly one feels committed to the basic tenets of Antisymmetry, and also on how successfully the latter will be able to deal with a variety of objections that have been raised concerning the framework in general (see, for example, Friedemann 1995) and the proposed analysis of relatives in particular (see, for example, Borsley 1997). A thorough evaluation of such objections goes way beyond the scope of this study. I will nonetheless note here two issues that concern a particular aspect of the analysis of relatives outlined in this section, and which need to be addressed in future research.

Thus, a central feature of the Kayne-Bianchi analysis which was taken over in this section is that raising is triggered by properties of an external D, or of some 'lower' functional Head within the complex DP. Now, as Jackendoff (1977) and Borsley (1997) observed, a complete analysis of appositives would need to generalize to such non-nominal constructions as those in (40).

(40) a.   Mary is extremely smart, which John, unfortunately, is not.
      b.   Mary has traveled from Toronto to L.A., which is a pretty long distance.
      c.   John died yesterday, which is something we had not expected.

Such a generalization depends on the plausibility of positing appropriate functional categories that play a role comparable to that of D in nominal appositive constructions.

A second unresolved issue, which was in fact noted in Bianchi (1995, Chapter II, section 10), concerns the treatment of 'hydras' (Link 1984), such as the one in (41).

(41)   *The* man and *the* woman who disliked each other...

Assuming that the stage following the first raising operation (to SpecFP) is essentially … *[who [man and woman] disliked each other] …*, the conjuncts would need to separately raise to distinct targets in order to check features on the two boldfaced items. A solution within the strongest version of Antisymmetry, which insists on linear ordering of all elements, and thus

of conjuncts, at all stages of a derivation (see Kayne 1994, section 5.2) seems unlikely, but it might be possible to handle such facts within a version of Asymmetry that incorporates some of the assumptions in Williams (1978), in particular, the view that conjuncts may be superimposed in a third dimension at the stage where movement operations take place.

Pending solutions to these and other problems, the proposals made in this section must be considered tentative.

4. Summary of results

This paper has argued that the search for a purely configurational characterization of the various semantic subtypes of relatives is likely to prove quixotic even with respect to individual languages, and *a fortiori* with respect to UG. It was proposed instead to use a system of interpretable features which is flexible enough to capture both similarities and differences among subtypes, and which can straightforwardly trigger suitable interpretive procedures.

The paper has also sketched a characterization of a feature [REL], which defines a 'core' class of relative clause constructions in which the dependencies that hold between the clause and certain types of external material are pre-encoded by Merge, with resulting locality effects, and possibly also by Move, if conceivable objections to the raising analysis can be satisfactorily answered. The core status assigned to this class may also be viewed as justified on the grounds that three semantic operations, in particular, those that yield appositives, restrictives, and maximalizers, are in principle available within it, while the non-core correlative and existential constructions apparently allow single semantic interpretations.

The applicability of three semantic operations to the core has been illustrated only in relation to post-nominal constructions, but the same state of affairs is arguably attested in pre-nominal constructions as well. It has often been noted that a restrictive/appositive ambiguity exists in certain pre-nominal adjectival constructions (such as *the industrious Japanese*), as well as in the pre-nominal participial constructions of German, Dutch and Turkish, and in the pre-nominal relatives of Japanese and Korean (even though the distinction is usually not accompanied by morphosyntactic or prosodic reflexes). The restrictive reading can be teased out by using certain Ds or particles that are inconsistent with appositive readings, yielding such unambiguously restrictive constructions as *the only industrious Japanese, every industrious Japanese,* and *no industrious Japanese.* That genuine ambiguity, and not vagueness, is found in such cases is brought out by the impossibility of 'cross-readings' in data like (42).

(42)   John admires the industrious Japanese, and so does Bill.

Comparable effects are found in the more elaborate pre-nominal constructions of other languages that were alluded to above (demonstration omitted). If so, we may expect that such constructions will also allow maximalizing construals. I provide confirming evidence based on the German so-called 'extended participial' construction.

Carlson (1977) observed that one clause-internal type of syntactic context that appears to favour maximalizing readings is that of cardinality/measure expressions. This context was already illustrated in (7), where it was noted that German is not among the languages that allow deviations from the diagnostic restriction on the external Ds of maximalizing constructions; that is to say, data like the acceptable versions of (7a-b) cannot be constructed in German. This claim is illustrated in (43a) with respect to post-nominal relatives. That the generalization also holds for pre-nominal participles is shown in (43b).

(43) a.   {Die drei, #drei} Meilen, die   du noch laufen musst, sind genau was
              the   three three miles   which you still run   must are just   what
              du   brauchst, um   deine Aggressionen loszuwerden.
              You   need   in-order your aggressions   to-get-rid-of
              '{The three, #three} miles that you must still run are just what you need
              to get rid of your feelings of aggression,'

     b.   {Die drei, #drei} von dir noch zu laufenden Meilen sind genau was
              the   three three by you still to running   miles are   just   what
              du   brauchst, um   deine Aggressionen loszuwerden.
              you   need   in-order your aggressions   to-get-rid-of
              [same meaning as (43a)]

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